

Remarks

Claims 1-18 and 20-23 were pending.

Claim 1 is amended.

Claims 6 and 7 are cancelled.

Claims 2, 4-6, 8, 12-17, 20 and 21 are original.

Claim 24 is new.

Claims 3, 9-11, 18, 22 and 23 are as previously presented.

The application now contains claims 1-5, 8-18 and 20-24.

Claim 1 is amended to insert the limitations of original claim 7 into the definition of component a), to insert the limitations of original claim 6 into the definition of component b), and to insert the limitation that the total solids content of the aqueous polymer dispersion is more than 20% by weight based on the total weight of the aqueous polymer dispersion. Support is found in the original claims and in the specification on page 4, lines 25-29.

Support for new claim 24 is found in claim 1 and in Examples A1-A8 of the instant specification pages 74-77 of the instant specification.

No new matter is added.

Rejections

Claims 1-18 and 20-23 are rejected under 35 USC 103(a) over Berner, et. al., US 5,476,882 which discloses polymeric micro particles stabilized by incorporation of light stabilizers. Berner also discloses the formation of polymers in the presence of the stabilizers.

Applicants respectfully traverse the rejections.

The instant invention provides a dispersion in water of a polymer carrier and a non-polar, water insoluble light stabilizer wherein the amount of light stabilizer exceeds that of the carrier polymer. The carrier polymer of the invention is prepared by an oil in water radical polymerization of one or more selected acrylates or styrenes in the presence of the light stabilizer. The polymer / stabilizer mixture thus obtained has properties that are very different from almost identical polymer / stabilizer mixtures wherein the polymer is prepared in the absence of the stabilizer as shown in the declaration submitted May 28, 2008, specifically, stable dispersions with much higher concentrations of light stabilizer relative to carrier polymer can be prepared with the instant polymer / stabilizer mixture. The desirability and difficulties in obtaining aqueous dispersions with a high relative concentration of light stabilizer are discussed in the first three pages of the instant specification.

For an invention to be obvious over a reference, the whole of the reference must be considered. The MPEP states that an "as a whole assessment" of the art requires a showing that it would have been obvious for one, when confronted by the problems address by the inventor, to have selected the elements of the claimed invention based on what was clearly known or disclosed at the time. Applicants take the position that an as the whole assessment of Berner, in light of what was known at the time of the invention would not suggest fundamental features of the instant invention.

Berner discloses that stabilizer micro-particles can be prepared by the polymerization of monomers in the presence of stabilizers and that one can prepare aqueous dispersions of these micro-particles. Applicants and the Examiner disagree about the statement in Berner, column 1 lines 52-54, "wherein the micro particles contain 0.1 to 30% by weight relative to the monomers, of one or more light stabilizers". While Applicants take this statement to mean that the micro particles contain at most 30% stabilizers relative to polymer, the Examiner states that Berner sets no limit to the amount of polymer, Berner only sets limits on the amount of monomer being polymerized.

Applicants respectfully note that none of the Examples in Berner approach even 30% concentration of stabilizer in the resulting micro-particles. Applicants further suggest that one skilled in the art would expect most of the available monomer to take part in the polymerization reaction and note that co-polymers are typically described by the amounts of the monomer units incorporated therein. Given that Berner prefers the use of reactive stabilizers and the formation of random or grafted co-polymers, and given that the micro-particles of Berner are all products defined essentially by the process with which they are made, Applicants believe that the phrase in question relates to the weight of the monomers incorporated into the polymer of the polymer / stabilizer micro-particles, or at least represents a good approximation thereof.

The Examiner also states that Berner shows the polymerization of monomers in the presence of stabilizers, and that prior to polymerization, once the stabilizer is added to monomers, there is 0 polymer present. Once polymerization begins the claim limitation is met...from the time in which the polymer is formed until the point in which more polymer is formed than stabilizer present. Applicants point out that the instant invention relates specifically to aqueous dispersions and there are no examples in Berner wherein the polymerization occurs in the presence of water. Xylene is often used in Berner to aid in the removal of water which forms during the polymerization, e.g., col 43, lines 19-20.

Thus, even in the intermediate stage of reaction suggested in the Action, there is no aqueous dispersion meeting the instant limitations formed during the exemplified process in Berner, no teaching on how to isolate this intermediate reaction mixture and convert it into an aqueous dispersion, and no suggestion as to what properties such a dispersion might have.

Berner does exemplify the preparation aqueous dispersion of the micro-particles. For example, beginning with line 59 of column 55, Berner adds a dispersion of micro-particles in heptane to a mixture of water, butoxyethanol and a small amount of diethylaminoethanol in "a way that all the hexane distills off immediately". Berner thus teaches the formation of aqueous dispersions only of the final micro-particles. Applicants doubt that one could with confidence stop the reaction of Berner at the intermediate stage, to obtain a product mixture very different from any product provided by Berner, and use that mixture in the process described in Berner to prepare a stable aqueous dispersion of the instant invention.

While Berner does not exemplify preparing the micro-particles in the presence of water, for example, the use of oil in water emulsion polymerization as required by the instant invention, Berner does mention the possibility of using emulsion polymerization, column 37, lines 56-64. On one hand it could be argued that one would be motivated to use an emulsion polymerization process to prepare micro-particles of Berner, and at some time early in the reaction an aqueous mixture containing all of the light stabilizer and only a small amount of polymer would present as suggested by the Examiner above. Applicants respectfully take the position that Berner, in fact, clearly suggests that the practitioner would not be successful in obtaining a stable aqueous dispersion in this manner.

For example, in considering all that the reference teaches, Applicants point to the paragraph that bridges columns 3 and 4 of Berner which teaches that the more simple micro particles of Berner do not form stable dispersions:

"The polymer microparticles according to the invention can, for example, consist solely of the crosslinked polymer core which then contains the light stabilizer. However, they then **frequently do not form stable dispersions** (the particles settle out) or the dispersion must be additionally stabilized by means of dispersants. Moreover, the distribution in the liquid continuous phase of the coating composition, in which the microparticles can be employed, is not ideal. It is therefore particularly preferred to modify the microparticles in such a way that stable dispersions in numerous dispersion media and good distribution in the liquid continuous phase of coating compositions are ensured. A

preferred modification comprises attaching substantially linear or slightly branched polymer chains to the actual microparticle core, for example by polymerization or condensation onto the core (grafting). These linear polymers contain functional groups having such a ratio of hydrophilic and hydrophobic functions that the dispersibility of the resulting complete microparticle is enhanced and a stable dispersion is thus ensured..."

The process whereby microparticles which form stable dispersions is discussed in column 37, lines 11-51 of Berner, immediately preceding the mention of emulsion polymerization:

"It is particularly advantageous to produce microparticles which contain parts effecting improved dispersibility of the particles. These parts can, for example, consist of an amphipathic dispersant which is an essentially linear to branched polymer polymerized onto the polymer microparticle core.

The process according to the invention is therefore carried out, for example, by

- a) polymerizing one or several different ethylenically mono- or poly-unsaturated monomeric compounds or/and one or several different monomers...,
- b) polymerizing one or more of the monomers indicated under a) to give an essentially linear to branched polymer and
- c) polymerizing (grafting) the polymer obtained according to b) onto the polymer obtained according to a), the polymerization according to a) or according to b) or both polymerizations being carried out in the presence of one or more light stabilizers, ...and the total quantity of light stabilizer being 0.1 to 30% by weight, relative to the monomers in both polymerization steps...

The monomers which can be used in step b) are in principle those which are also employed for step a). However, they must be selected such that no cross linking occurs during the polymerization. The linear to branched polymers obtained according to step b) ("amphipathic dispersants") are preferably copolymers which are grafted in the conventional manner onto the crosslinked polymers obtained according to a) ("core"). Microparticles with a particularly good light stabilization are obtained when the addition of the light stabilizer is made to the polymerization step b) or to both step b) and step a)."

Applicants respectfully assert that Berner teaches that to form stable dispersions, one needs to use the copolymer obtained by carrying out all three steps, a, b and c. Thus, the stage at which there is all of the light stabilizer and only a small amount of polymer is taught to explicitly be an intermediate on the way to a dispersible micro-particle. Further, Applicants question at which point during this process does one find a stable dispersion, especially as the reactions conditions require significant stirring.

In light of the Examples in Berner, the teaching in Berner that simpler microparticles disperse poorly, the discussion in Berner relating to the preparation of dispersible micro-particles, and the difficulties in preparing stable aqueous dispersions with high relative concentrations of non-polar light stabilizers experienced at the time of the invention, Applicants respectfully take the position that upon reading Berner, one would be directed away from the instant invention. Certainly, nothing in Berner directs one to try to obtain a stable aqueous dispersion of a polymer / light stabilizer mixture wherein the light stabilizer was present in a larger amount than the carrier polymer.

Previously, the Examiner has rejected Applicants' assertion that the cited art does not disclose the instant aqueous dispersion regarding the high amount of stabilizer to carrier polymer, stating that Berner sets no limit to the amount of polymer that may be produced; Berner only sets limits on the amount of monomer being polymerized. The Action further states that one would obviously desire as high an amount of stabilizer as possible and the fact that Berner does not disclose the instant amount of stabilizer does not render the claims patentable. Further, one of ordinary skill has an expectation of certain properties, obviousness does not require an absolute certainty of success and that there is no showing or allegation of unexpected results of record.

Regarding whether an allegation of unexpected results exists in the record, Applicants respectfully make the following assertions. Prior to Applicants invention, the instant polymer, prepared according to the invention by oil in water emulsion polymerization in the presence of the light stabilizer was unknown. The polymer prepared according to the invention has properties that are different from otherwise identical polymers prepared in the absence of the stabilizers as shown in the declaration of record. Prior to Applicants invention, a stable aqueous dispersion containing the instant ratio of non-polar light stabilizer to carrier polymer is not suggested and the difficulties of obtaining such a dispersion are discussed in the first three pages of the application. The value of the instant dispersions is demonstrated in the coating application samples beginning at the bottom of page 77.

The fact of the stability of the dispersion is in itself a significant and unpredictable finding in light of the art, especially in light of the teaching in Berner that the simpler microparticles therein "frequently do not form stable dispersions (the particles settle out) or the dispersion must be additionally stabilized by means of dispersants" and that special steps must be taken to insure dispersibility.

Applicants further respectfully assert that the mere fact that one skilled in the art would desire a high concentration of stabilizer relative to carrier polymer in the dispersion offers no direction as to how to attain such a dispersion. The failure in the art to provide such a composition is the problem solved by the instant invention as discussed in the instant specification. Further, the lack of a specific statements in Berner regarding the amount of "polymer" relative to stabilizer does not constitute a disclosure of the unsaid composition, especially in light of the art discussed in the specification, the teachings in Berner about the difficulties in arriving at stable dispersions, and most especially in the lack of any examples providing a dispersion with the high stabilizer to polymer ratio or suggestions to attempt such a feat.

Further, Applicants aver that in light of the art, while one of ordinary skill has an expectation of certain properties, those expected properties would not be the stable concentrated dispersions afforded by the instant invention. Not only is no there no absolute certainty of success, until Applicants invention there was ample reason to expect failure.

The examiner has dismissed the declaration described above as not being related to the closest art because Berner discloses reacting the monomers in the presence of the stabilizer. The declaration compares the instant dispersion to the polymer prepared without stabilizer present.

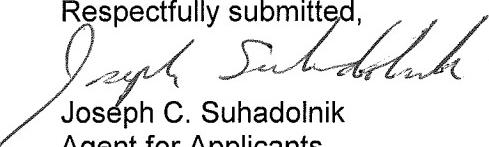
Applicants completely disagree with this finding. There is no example in Berner wherein any dispersion, in particular an aqueous dispersion, containing more than 3% stabilizer relative to polymer is prepared, the polymers prepared in Berner are not the emulsion polymers of the instant invention (it is known that the process of polymerization when using the instantly claimed monomer greatly impacts the resulting polymer properties) and Berner specifically teaches special polymer/stabilizer mixtures using specific polymerization steps are to be used when preparing stable dispersions. Applicants respectfully submit that the instant dispersions, and the polymer / stabilizer mixtures therein, are well outside the teaching of Berner.

The Examiner has also stated that the instant claims read on a master batch or concentrate. Applicants respectfully respond that one skilled in the art is well aware of what constitutes an aqueous dispersion, especially in view of the first three pages of the instant specification. A master batch or concentrate is a mixture containing a carrier material and a higher amount of an active ingredient than is actually needed for the purpose at hand. The amount of active ingredient is diluted by the addition of more carrier which may be the same as the concentrate carrier material. Whether a composition is

characterized as a masterbatch or concentrate therefore depends mainly on its intended use. Applicants fully expect that the instant compositions will be used to introduce stabilizers into other materials such as polymers and in this manner can be characterized as a concentrate. This is made clear in the specification. Applicants believe that whether the instant dispersion is characterized as a master batch or concentrate is not germane to the question of whether the instant dispersions are known and whether their preparation can be readily deduced from the art.

Applicants respectfully submit that the rejections under 35 USC 103(a) over Berner, et. al., US 5,476,882 are addressed and are overcome and kindly ask that the rejections be withdrawn and that claims 1-5, 8-18 and 20-24 be found allowable. In the event that minor amendments will further prosecution, Applicants request that the Examiner contact the undersigned representative.

Respectfully submitted,


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